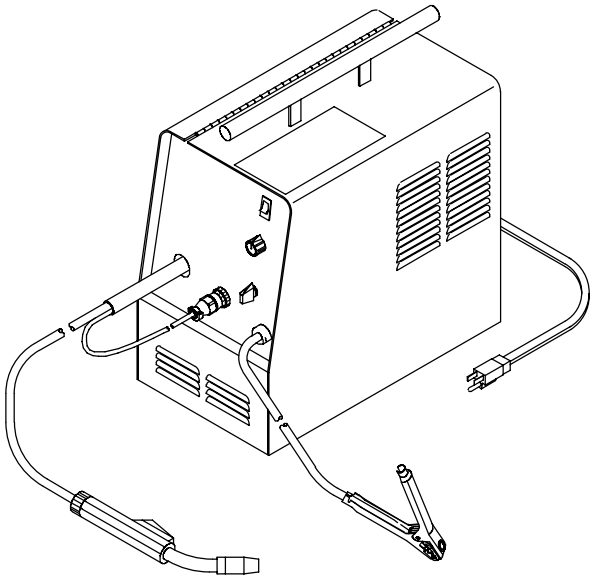
Miller®

Gold Seal™

October 1997 Form: OM-174 470B
Effective With Serial No. KH531011

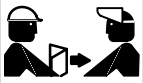
OWNER'S MANUAL



Gold Seal™ Model 420

- CV/DC Welding Power Source/Wire Feeder
- For FCAW And GMAW Welding
- 90 Amperes, 18 Volts At 20% Duty Cycle
- Uses 115 Volts AC, Single-Phase Input Power
- Overheating, Short-Circuit, And Motor Overload Protection
- Usable Range Of 30 To 130 Amperes
- Includes Gun, Welding Wire, And Gas Valve

- Read and follow these instructions and all safety blocks carefully.
- Have only trained and qualified persons install, operate, or service this unit.
- Call your distributor if you do not understand the directions.



- Give this manual to the operator.

- For help, call your distributor
- or: MILLER ELECTRIC Mfg. Co., P.O. Box 1079, Appleton, WI 54912 414-734-9821

© 1997 MILLER Electric Mfg. Co.

The following safety alert symbol and signal words are used throughout this manual to call attention to and identify different levels of hazard and special instructions.

⚠ WARNING

WARNING statements identify procedures or practices which must be followed to avoid serious personal injury or loss of life.

⚠ CAUTION

CAUTION statements identify procedures or practices which must be followed to avoid minor personal injury or damage to this equipment.

ARC WELDING SAFETY PRECAUTIONS

⚠ WARNING

ARC WELDING can be hazardous.

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR.

In welding, as in most jobs, exposure to certain hazards occurs. Welding is safe when precautions are taken. The safety information given below is only a summary of the more complete safety information that will be found in the Safety Standards listed on the next page. Read and follow all Safety Standards.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment.
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. Turn off all equipment when not in use.
7. Do not use worn, damaged, undersized, or poorly spliced cables.
8. Do not wrap cables around your body.
9. Ground the workpiece to a good electrical (earth) ground.
10. Do not touch electrode while in contact with the work (ground) circuit.
11. Use only well-maintained equipment. Repair or replace damaged parts at once.
12. Wear a safety harness to prevent falling if working above floor level.
13. Keep all panels and covers securely in place.

ARC RAYS can burn eyes and skin; NOISE can damage hearing.

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

1. Wear a welding helmet fitted with a proper shade of filter (see ANSI Z49.1 listed in Safety Standards) to protect your face and eyes when welding or watching.
2. Wear approved safety glasses. Side shields recommended.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved ear plugs or ear muffs if noise level is high.

FUMES AND GASES can be hazardous to your health.

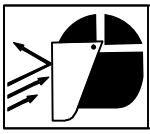
Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breath the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WELDING can cause fire or explosion.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
11. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.



FLYING SPARKS AND HOT METAL can cause injury.

Chipping and grinding cause flying metal. As welds cool, they can throw off slag.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

PRINCIPAL SAFETY STANDARDS

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Ref. sr1 2/92

TABLE OF CONTENTS

SECTION 1 – SPECIFICATIONS

1-1. Volt-Ampere Curve And Duty Cycle Chart 1

SECTION 2 – INSTALLATION

2-1. Installing Work Clamp 2
2-2. Installing Gas Supply 2
2-3. Connecting Input Power 2
2-4. Gun Polarity For Wire Type 3
2-5. Installing Welding Gun 3
2-6. Threading And Feeding Welding Wire 4

SECTION 3 – OPERATION 5

SECTION 4 – MAINTENANCE & TROUBLESHOOTING

4-1. Overload Protection 6
4-2. Drive Assembly Maintenance 7
4-3. Gun Maintenance 8
4-4. Troubleshooting 8

SECTION 5 – ELECTRICAL DIAGRAM 9

SECTION 6 – PARTS LIST

Figure 6-1. Main Assembly 11
Figure 6-2. MWG-160M Gun 12

SECTION 1 – SPECIFICATIONS

Table 1-1. Welding Power Source

Specifications	Description
Type Of Output	Direct Current/Constant Voltage (DC/CV)
Rated Weld Output	90 Amperes, 18 Volts DC, 20% Duty Cycle
Type Of Input Power	Single-Phase; 60 Hz; At 115 Volts AC
Input Amperes At Rated Output	20 A At 115 V
KVA/KW Used At Rated Output	3 kVA/2.2 kW
Max. Open-Circuit Voltage	30 Volts DC
Control Circuit Voltage At Gun	24 Volts DC
Welding Processes	Gas Metal Arc (GMAW) And Flux Cored Arc Welding (FCAW)
Calculated Speed Range At No Load	283 To 716 ipm (7.1 To 17.9 mpm)
Wire Diameter Range	.023 To .035 in (0.58 To 0.89 mm)
Overall Dimensions	Length: 16-1/2 in (419 mm); Width: 9-1/2 in (241 mm); Height: 17 in (432 mm)
Weight	Net: 73 lb (33 kg); Ship: 80 lb (36 kg)
Welding Gun	
Rated Output (Air-Cooled)	160 Amperes At 60% Duty Cycle Using CO_2 Shielding Gas
Cable Length	10 ft (3 m)

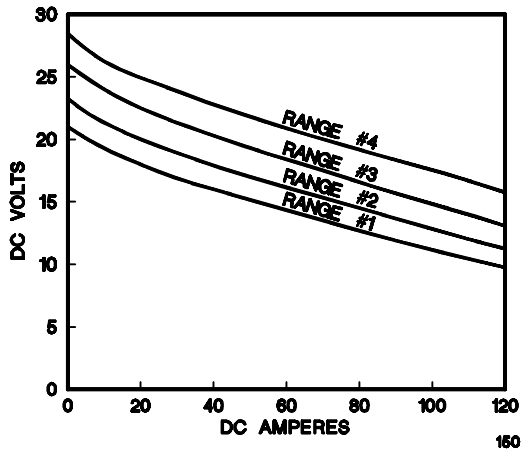
1-1. Volt-Ampere Curve And Duty Cycle Chart

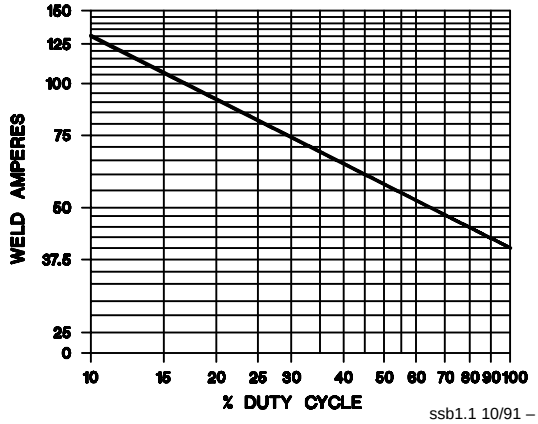
⚠ CAUTION

USING GUN BEYOND DUTY CYCLE RATING can damage gun.

- Do not use gun beyond rated amperage when using CO_2 shielding gas.
- Use gun at 30% duty cycle when using mixed shielding gas.

wfwarn8.1 10/91





The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding power source. Curves of other settings fall between the curves shown.

Duty cycle is how long the unit can operate within a ten minute period without causing overheating or damage.

This unit is rated at 20% duty cycle allowing welding 2 minutes out of every 10 minutes.

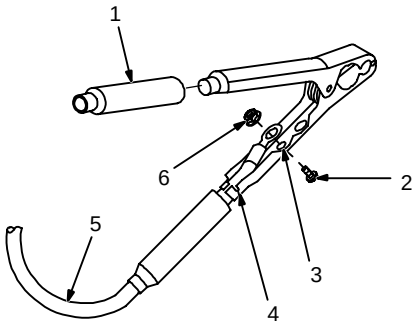
This gun is rated at 60% duty cycle when using CO_2 shielding gas and 30% when using mixed shielding gas.

ssb1.1 10/91 – SB-124 646-A / sb1.3 10/91 – SB-124 655-A

Figure 1-1. Volt-Ampere Curve And Duty Cycle Chart

SECTION 2 – INSTALLATION

2-1. Installing Work Clamp



1 Insulator
2 Bolt
3 Smaller Hole
4 Work Clamp Tabs

Bend tabs around work cable.

5 Work Cable From Unit
6 Nut

Tools Needed:

3/8, 7/16 in

Ref. ST-025 190-D

Figure 2-1. Installing Work Clamp

2-2. Installing Gas Supply

WARNING

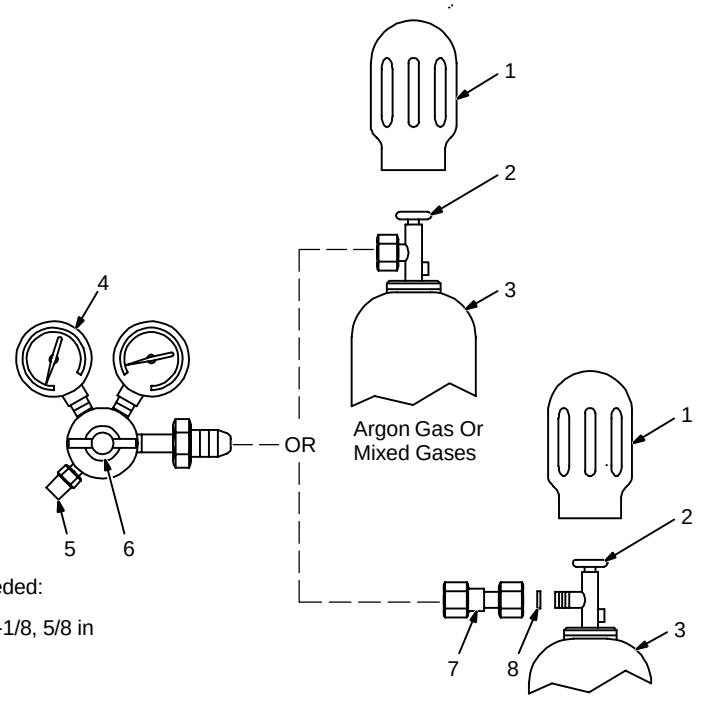
CYLINDERS can explode if damaged.

- Keep cylinders away from welding and other electrical circuits.
- Never touch cylinder with welding electrode.
- Always secure cylinder to running gear, wall, or other stationary support.

BUILDUP OF SHIELDING GAS can harm health or kill.

- Shut off shielding gas supply when not in use.

warn4.1 9/91



Chain gas cylinder to running gear, wall, or other stationary support so cylinder cannot fall and break off valve.

1 Cap
2 Cylinder Valve
3 Cylinder
4 Regulator/Flowmeter
5 Gas Hose Connection

Fitting has 5/8-18 right-hand threads.

6 Flow Adjust

Typical flow rate is 20 cfh (cubic feet per hour). Check wire manufacturer's recommended flow rate.

Make sure flow adjust is closed when opening cylinder to avoid damage to the flowmeter.

7 CO_2 Adapter
8 O-Ring

Install adapter with O-ring between regulator/flowmeter and CO_2 cylinder.

Tools Needed:

1-1/8, 5/8 in

ssb3.1* 5/94 – ST-158 697-A / Ref. ST-149 827-B

Figure 2-2. Typical CO_2 Regulator/Flowmeter Installation

2-3. Connecting Input Power

Connect unit to a properly grounded receptacle of a 20 ampere individual branch circuit protected by time-delay fuses or circuit breakers. Select an extension cord of 12 AWG for up to 75 ft (23 m) or 10 AWG for up to 140 ft (46 m).

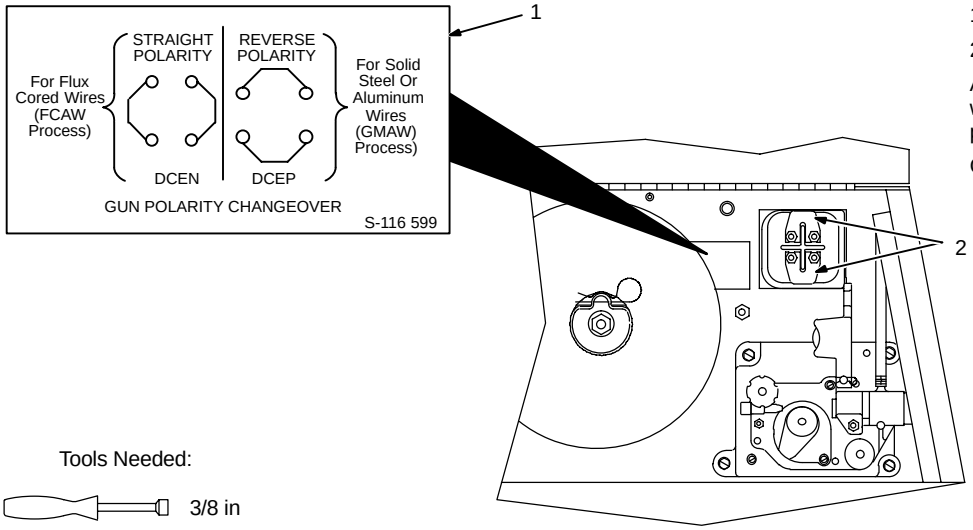
2-4. Gun Polarity For Wire Type

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting or installing.

swarn1.1 2/93



1 Polarity Changeover Label

2 Polarity Jumper Links

Always read and follow welding wire manufacturer's recommended polarity.

Close door.

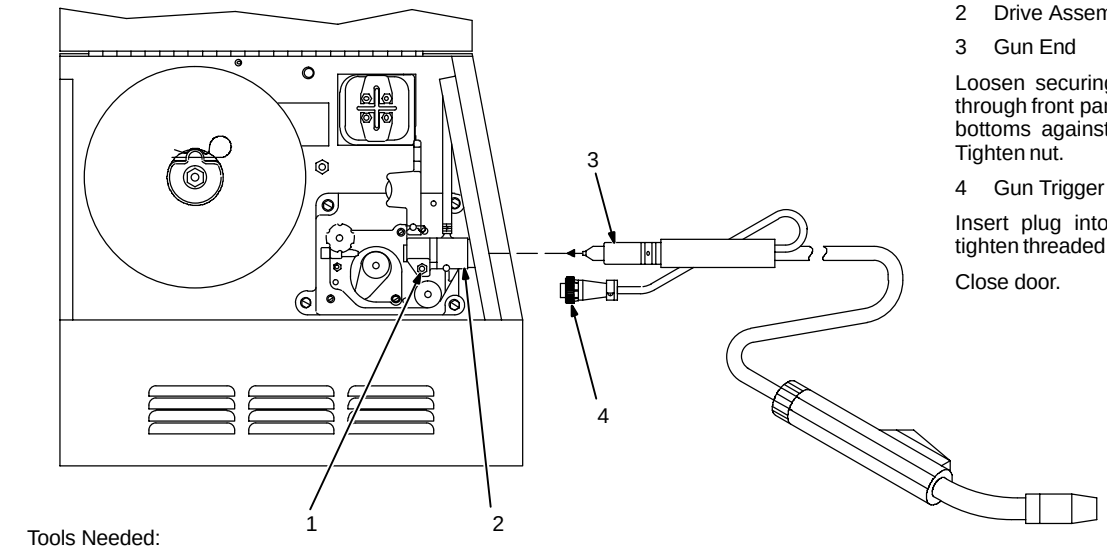
Tools Needed:

3/8 in

Ref. ST-155 506–A

Figure 2-3. Gun Polarity Connections

2-5. Installing Welding Gun



1 Gun Securing Nut

2 Drive Assembly

3 Gun End

Loosen securing nut. Insert end through front panel opening until it bottoms against drive assembly. Tighten nut.

4 Gun Trigger Plug

Insert plug into receptacle, and tighten threaded collar.

Close door.

Tools Needed:

5/16 in

Ref. ST-155 506-A

Figure 2-4. Gun Connections

2-6. Threading And Feeding Welding Wire

⚠ WARNING

CYLINDERS can explode if damaged.

- Keep cylinders away from welding and other electrical circuits.
- Never touch cylinder with welding electrode.
- Always secure cylinder to running gear, wall, or other stationary support.

WELDING WIRE can cause puncture wounds.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.

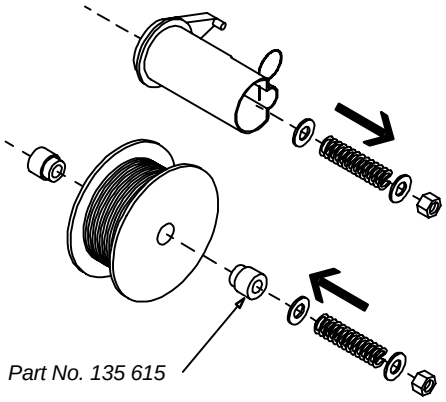
The welding wire, drive rolls, drive assembly, and all metal parts touching the welding wire are electrically live when welding or feeding wire using gun trigger.

HOT SURFACES can burn skin.

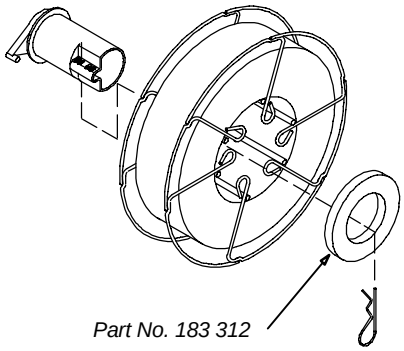
- Allow gun to cool before touching.

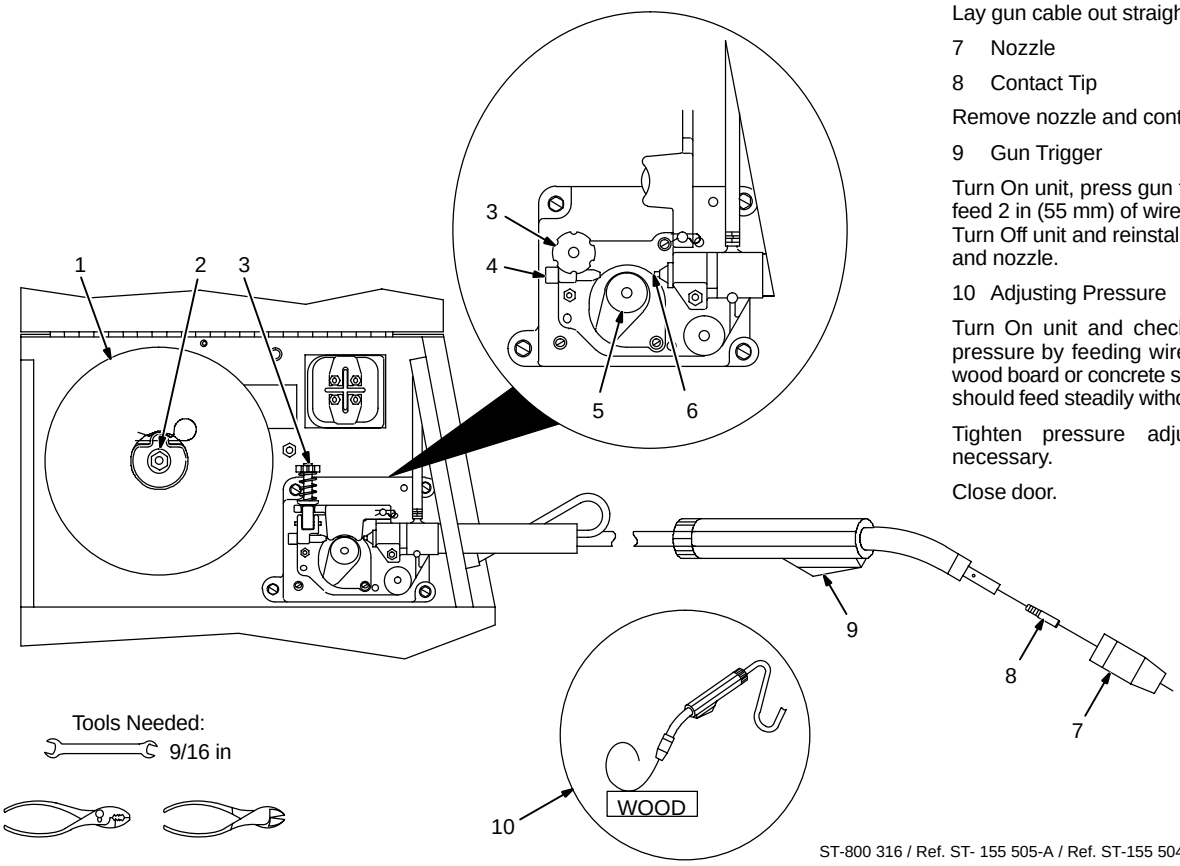
swarn5.1 10/91 / swarn2.1 9/91

TO USE 1 LB SPOOL:



TO USE Standard Wire Reel:





1 Wire Spool

2 Hub Tension Nut

Grasp spool in one hand and turn while using a wrench to adjust nut. When a slight force is needed to turn spool, tension is set.

Loosen wire from spool, cut off bent wire, and pull 6 in (150 mm) of wire from spool.

3 Pressure Adjustment

Open pressure assembly.

4 Wire Inlet Guide

5 Drive Roll

6 Wire Outlet Guide

Thread wire through inlet guide, along drive roll groove, and into outlet guide. Close pressure assembly.

Lay gun cable out straight.

7 Nozzle

8 Contact Tip

Remove nozzle and contact tip.

9 Gun Trigger

Turn On unit, press gun trigger, and feed 2 in (55 mm) of wire out of gun. Turn Off unit and reinstall contact tip and nozzle.

10 Adjusting Pressure

Turn On unit and check drive roll pressure by feeding wire against a wood board or concrete surface; wire should feed steadily without slipping.

Tighten pressure adjustment if necessary.

Close door.

ST-800 316 / Ref. ST- 155 505-A / Ref. ST-155 504-A / S-0627-A

Figure 2-5. Feeding Welding Wire

SECTION 3 – OPERATION

⚠ WARNING

READ SAFETY BLOCKS at beginning of manual before proceeding.

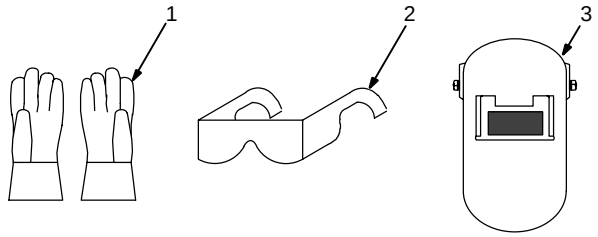
MOVING PARTS can cause injury.

- Keep away from pinch points such as drive rolls.
- Keep all doors, panels, covers, and guards closed and securely in place.

ARCING can damage switch.

- Do not change Voltage switch position while welding.

Arcing inside switch can damage contacts, causing switch to fail.



1 Insulating Gloves

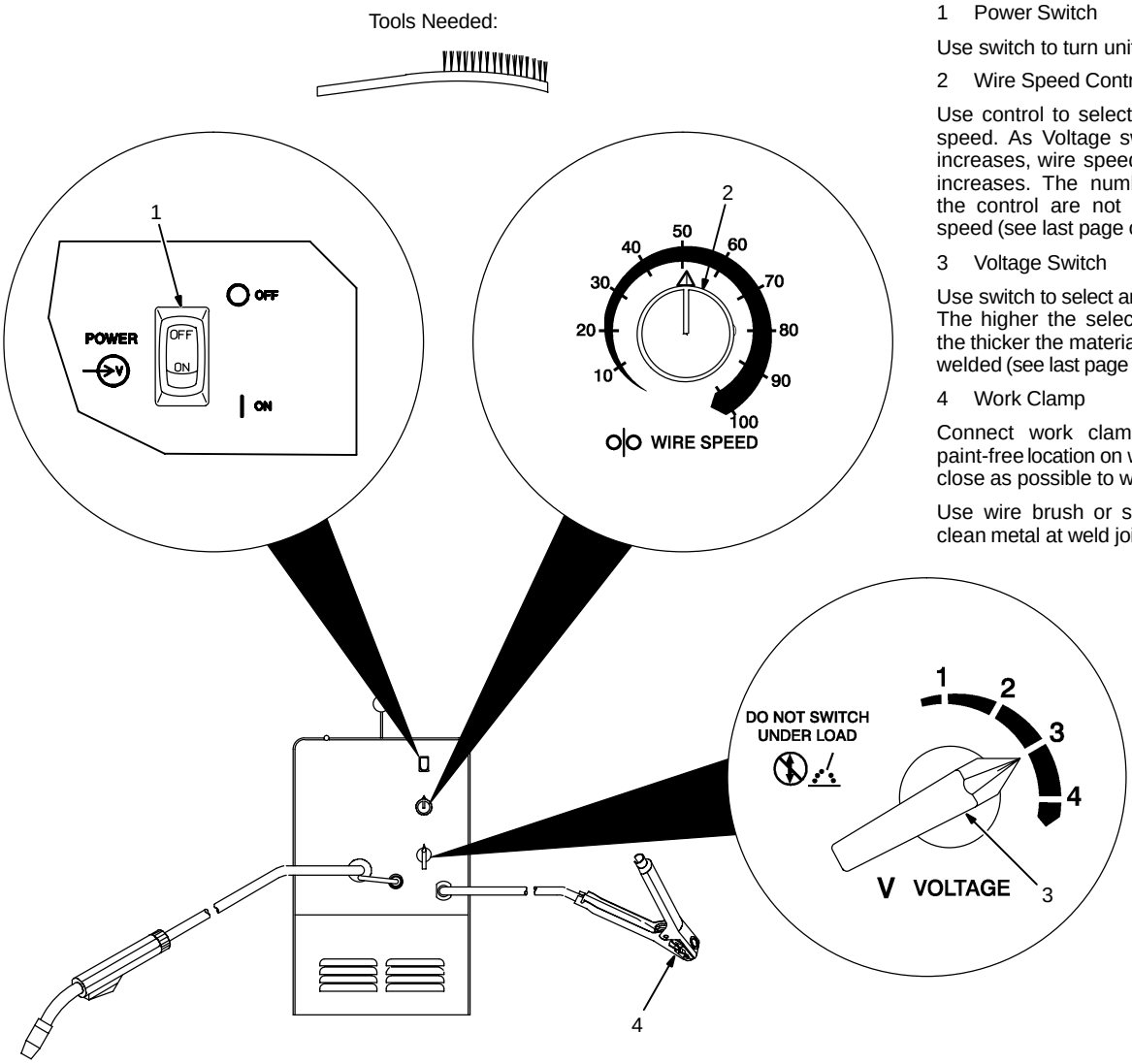
2 Safety Glasses With Side Shields

3 Welding Helmet

Wear dry insulating gloves, safety glasses with side shields, and a welding helmet with a correct shade of filter (see ANSI Z49.1).

sb3.1 10/91

Figure 3-1. Safety Equipment



1 Power Switch

Use switch to turn unit On and Off.

2 Wire Speed Control

Use control to select a wire feed speed. As Voltage switch setting increases, wire speed range also increases. The numbers around the control are not a wire feed speed (see last page of Parts List).

3 Voltage Switch

Use switch to select an arc voltage. The higher the selected number, the thicker the material that can be welded (see last page of Parts List).

4 Work Clamp

Connect work clamp to clean, paint-free location on workpiece, as close as possible to weld area.

Use wire brush or sandpaper to clean metal at weld joint area.

Ref. ST-155 508-A / Ref. ST-182 488

Figure 3-2. Controls

SECTION 4 – MAINTENANCE & TROUBLESHOOTING

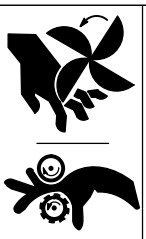
⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting, maintaining, or servicing.

HOT PARTS can cause severe burns.

- Allow cooling period before maintaining or servicing.



MOVING PARTS can cause injury.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

Maintenance and troubleshooting to be performed only by qualified persons.

swarn8.2* 2/93

Table 4-1. Maintenance Schedule

Time	Maintenance
Before each use.	Tighten all connections. Check gun and clean nozzle.
After each spool of wire.	Blow out gun liner. Clean and check wire drive parts; replace as necessary.
Every 3 months.	Tape or replace cracked cables; clean and tighten connections. Replace unreadable labels.
Every 6 months.	Blow out or vacuum inside of unit.

4-1. Overload Protection

⚠ WARNING

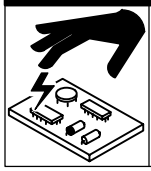
READ SAFETY BLOCKS at start of Section 4 before proceeding.

A. Overheating

Thermostat TP1 protects the unit from damage due to overheating. If main transformer gets too hot, TP1 opens and weld output stops, but fans keep running to cool transformer. Wait several minutes before trying to weld.

B. Motor Fuse F1

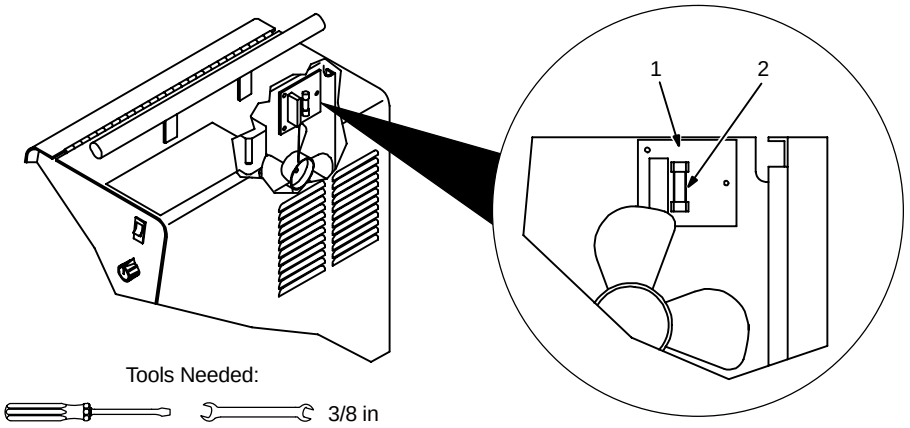
⚠ CAUTION



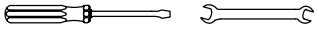
STATIC ELECTRICITY can damage parts on circuit boards.

- Put on grounded wrist strap BEFORE handling boards or parts.

fwarn5.1* 9/91



Tools Needed:



Turn Off and unplug unit. Unlatch door, remove handle, and remove door/wrapper.

1 Circuit Board PC1

Located behind fan.

2 Fuse F1 (See Parts List For Rating)

If this fuse opens, the wire drive motor does not run.

Pull fuse from fuse holder on PC1. To reinstall, push fuse into fuse holder.

Reinstall wrapper and handle, and latch door.

Ref. ST-155 640 / ST-149 327

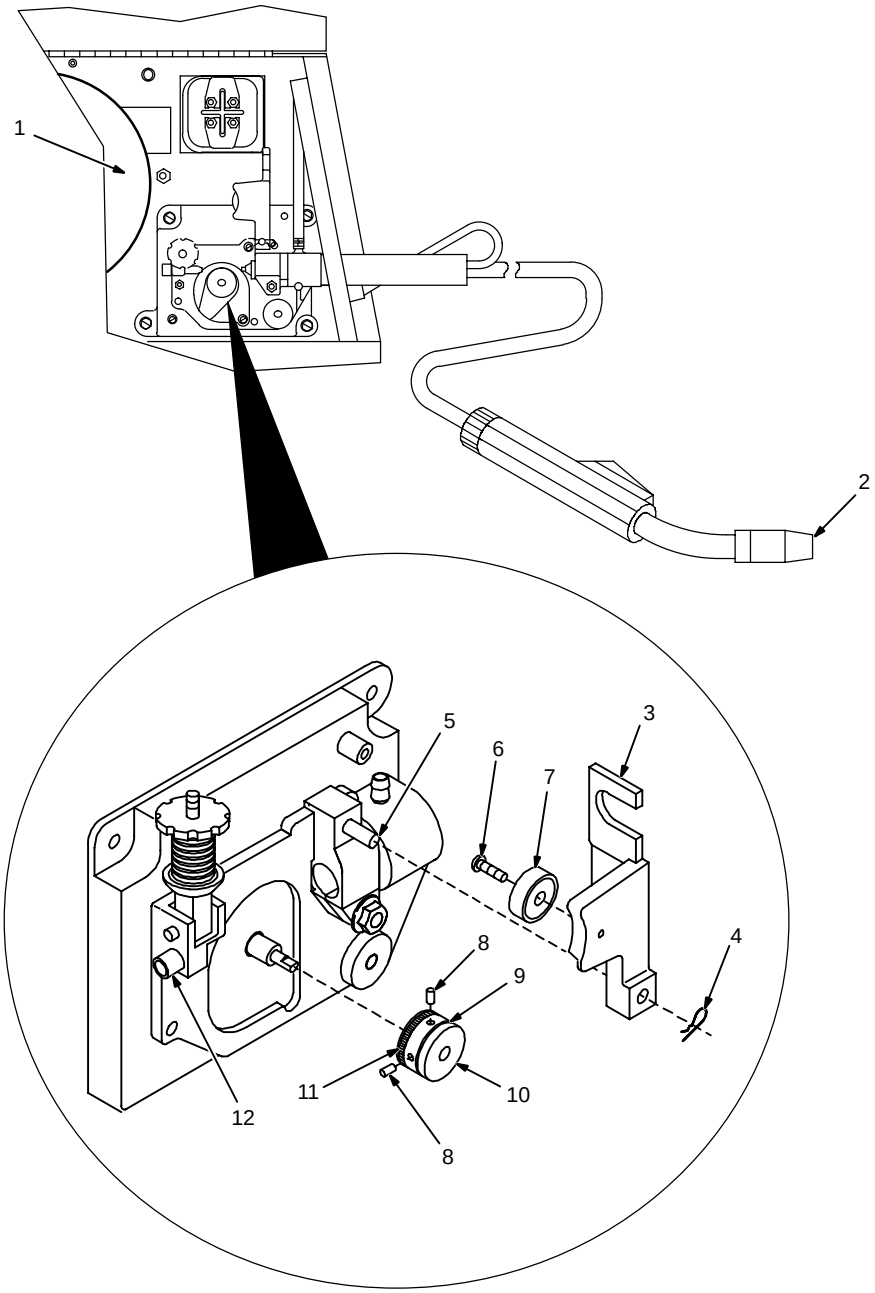
Figure 4-1. Fuse F1 Location

C. Short Circuit Shutdown

If contact tip is shorted and sticks to workpiece, the unit shuts down, but fan runs. To resume operation, release gun trigger, turn Off unit, and remove contact tip from workpiece. Check contact tip and replace if damaged. Turn On unit to continue operation.

4-2. Drive Assembly Maintenance

⚠ WARNING **READ SAFETY BLOCKS at start of Section 4 before proceeding.**



Turn Off and unplug unit.

1 Wire Spool

2 Gun Contact Tip

Cut welding wire off at contact tip. Retract wire onto spool and secure.

3 Pressure Roll Arm

4 Cotter Pin

5 Pin

6 Screw

7 Bearing

Remove bearing as shown. Install new bearing and secure with screw. Reinstall arm onto pin and secure with cotter pin.

8 Setscrew

9 Smooth Groove For Hard Wire

10 Drive Roll

Remove drive roll as shown.

Use a wire brush to clean drive roll. Push drive roll onto shaft with desired groove in. Turn drive roll so one setscrew faces flat side of shaft, and tighten both setscrews.

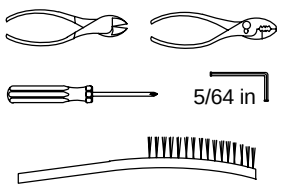
11 Knurled Groove For Flux-Cored Wire

12 Wire Inlet Guide

Remove guide by pressing on barbed area or cutting off one end near housing and pulling it out of hole. Push new guide into hole from rear until it snaps in place.

Thread welding wire (see Section 2-6). Close door.

Tools Needed:



ST-155 504-A / ST-154 199

Figure 4-2. Drive Assembly Maintenance

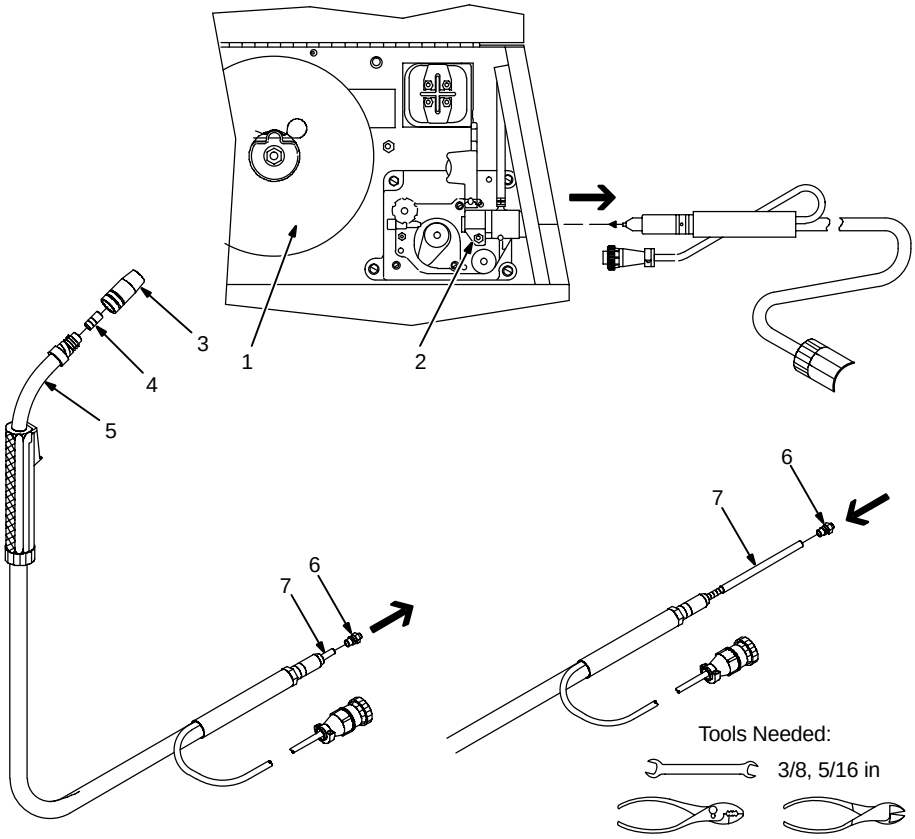
4-3. Gun Maintenance

⚠ WARNING **READ SAFETY BLOCKS at start of Section 4 before proceeding.**

FLYING METAL CHIPS AND DIRT can cause injury and damage equipment.

- Point gun away from people and in a safe direction when blowing out with compressed air.

swarn10.1 10/91



Turn Off and unplug unit.

1 Wire Spool

Cut welding wire off at contact tip. Retract wire onto spool and secure.

2 Gun Securing Nut

Disconnect trigger leads. Loosen nut and remove gun and trigger leads.

3 Nozzle

4 Contact Tip

5 Head Tube

6 Liner Collet

Disassemble gun as shown.

7 Liner

Pull liner from this end. Blow gun casing out with compressed air.

Insert new liner into gun casing until even with end of head tube.

Install collet onto liner.

Install contact tip and nozzle.

Insert gun into feeder and mark where liner touches drive roll. Remove gun and cut liner off. Reinstall gun so that liner is as close as possible to drive rolls without touching.

Thread welding wire (see Section 2-6). Close door.

Ref. ST-155 506–A / ST-155 509-A

Figure 4-3. Gun Maintenance

4-4. Troubleshooting

⚠ WARNING **READ SAFETY BLOCKS at start of Section 4 before proceeding.**

Welding Trouble	Remedy	Section
No weld output; wire does not feed.	Secure power cord plug in receptacle.	2-3
	Motor fuse F1 open, replace F1.	4-1B
	Replace building line fuse or reset circuit breaker if open.	– –
	Secure gun trigger leads or repair leads, or replace trigger switch.	2-5
No weld output; wire does not feed; fan motor continues to run.	Thermostat TP1 open (overheating). Allow fan to run; the thermostat will close when the unit has cooled.	4-1A
No weld output; wire feeds.	Connect work clamp to get good metal to metal contact.	Figure 3-2
	Replace contact tip.	4-3
Low weld output.	Connect unit to proper input voltage or check for low line voltage.	2-3

Wire Drive/Gun Trouble	Remedy	Section
Electrode wire feeding stops during welding.	Straighten gun cable and/or replace damaged parts.	4-3
	Adjust drive roll pressure.	2-6
	Readjust hub tension.	2-6
	Replace contact tip if blocked.	4-3
	Clean or replace wire inlet guide or liner if dirty or plugged.	4-2, 4-3
	Replace drive roll or pressure bearing if worn or slipping.	4-2
	Secure gun trigger leads or repair leads, or replace trigger switch.	2-5
	Check and replace F1.	4-1B
	Check and clear any restrictions at drive assembly and liner.	4-2, 4-3
	Have nearest Factory Authorized Service Station/Service Distributor check drive motor.	– –

SECTION 5 – ELECTRICAL DIAGRAM

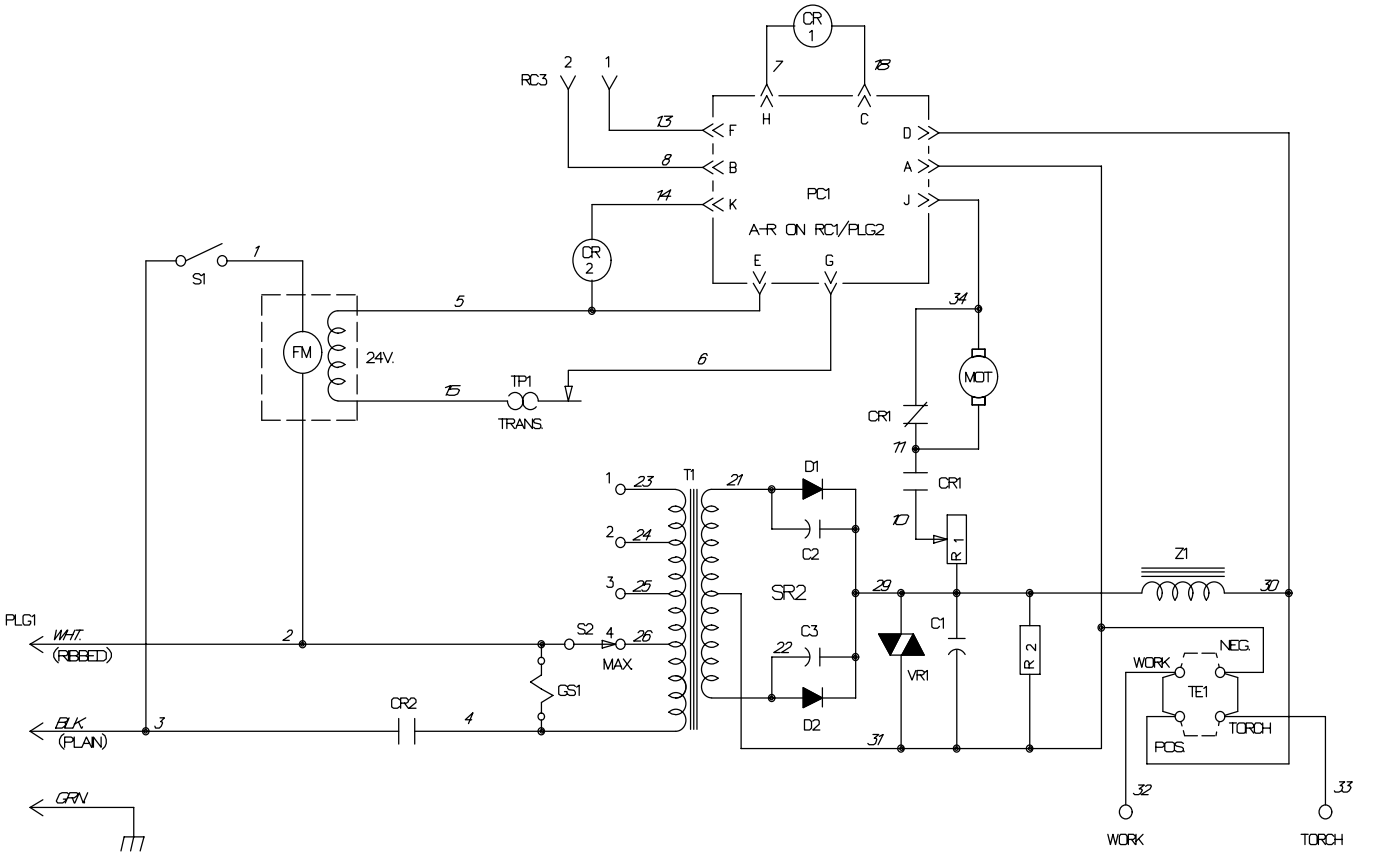


Figure 5-1. Circuit Diagram For Welding Power Source

NOTES

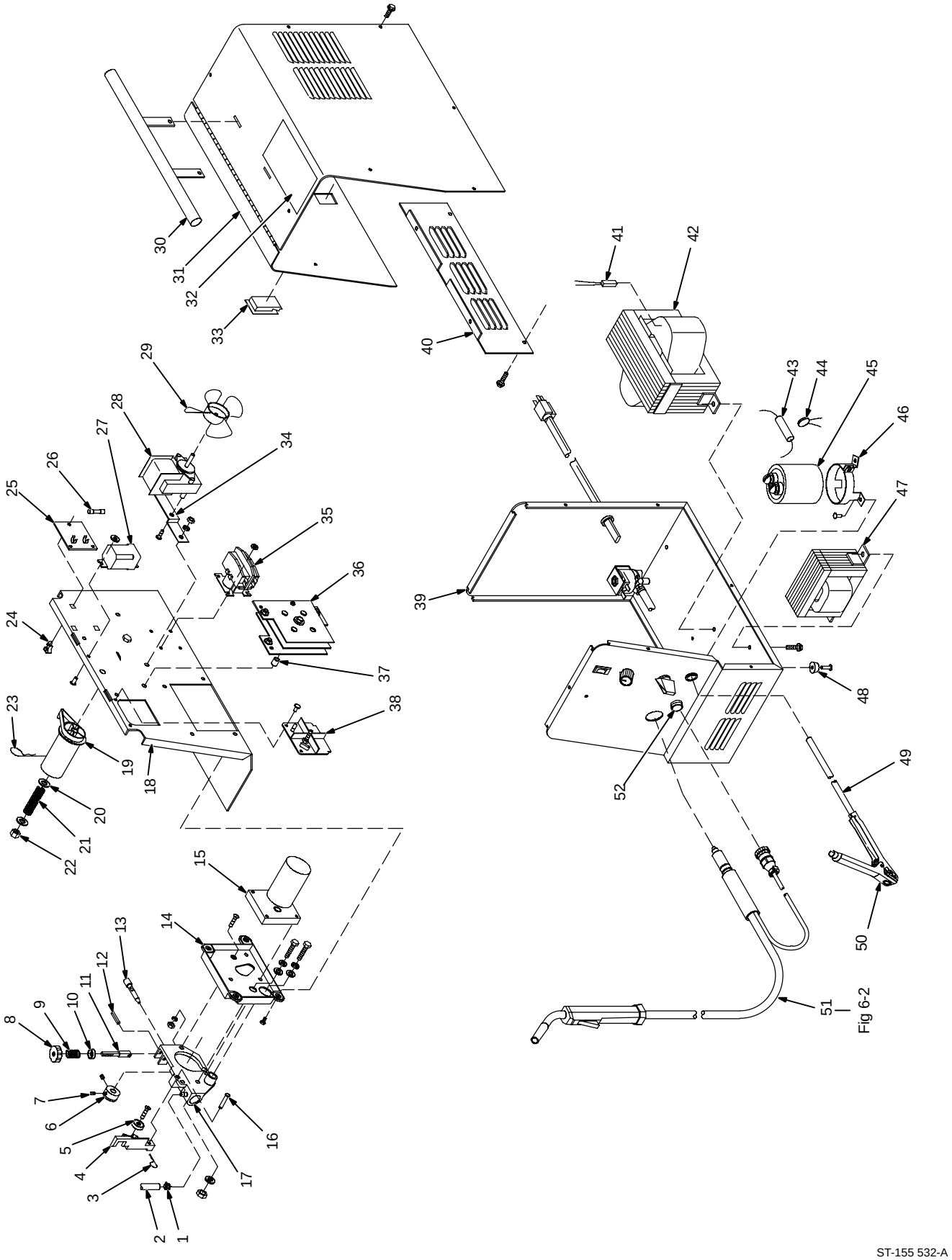


Figure 6-1. Main Assembly

Parts For Main Assembly

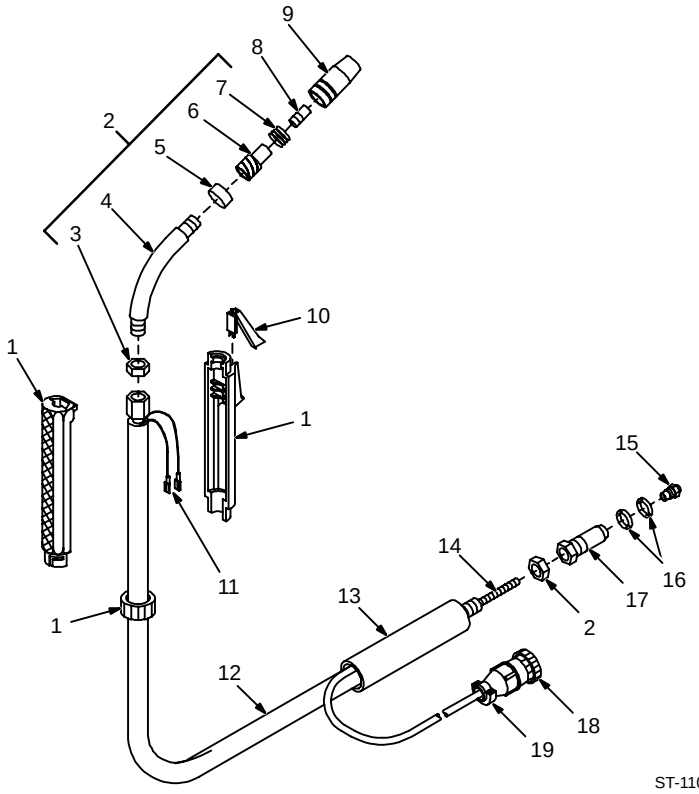
NOTE: All items indented by a dot(s) are included with the item listed directly above.

Item No.	Part No.	Description
1	149 332	Hose Clamp
2	147 635	Hose
	131 315	Drive Assembly
3	151 828	· Cotter Hair Pin
4	112 031	· Pressure Lever
5	090 443	· Bearing
	111 622	· · Spacer
6	154 827	· Drive Roll
7	602 169	· Set Screw
8	092 237	· Knob
9	090 415	· Spring
10	085 244	· Cupped Washer
11	085 242	· Fastener
12	010 224	· Spring Pin
13	058 549	· Wire Guide
14	129 893	· Insulator
15	173 446	· Drive Motor
16	090 416	· Hinge Pin
17	124 817	· Drive Housing
18	153 727	Baffle
19	111 929	Hub
	135 615	Bushing, .390 ID x .750 OD
20	010 910	Washer
21	073 355	Spring
22	010 909	Nut
23	111 998	Cotter Hair Pin
24	134 201	Stand-Off Support
25	119 539	Circuit Card
26	*073 426	· Fuse, slo-blo 5A
	118 936	Housing, 10 pin
	079 747	Terminal
27	006 393	Relay
28	111 931	Fan Motor
29	005 656	Fan Blade
30	153 729	Handle
	154 596	Cap, Handle
31	+153 724	Wrapper
32	134 464	Warning Label
33	089 899	Latch
34	120 675	Bracket
35	129 696	Contactor
36	119 264	Rectifier
37	010 047	Tubing
38	122 385	Terminal Assembly
	174 504	· Link
39		Case w/Cmpts
	116 996	· Gas Valve
	605 227	· Nyl Nut, gas valve
	147 545	· Cord Set
	111 443	· Bushing, cord set
	000 101	· Rheostat
	097 922	· Knob
	111 997	· Rocker Switch, SPST
	111 897	· Rotary Switch
	127 023	· · Knob
	155 530	· Case
	182 488	· Nameplate
	111 644	· Bushing, .875mtg
	025 338	· Bushing, .625mtg
40	153 722	Side Panel
41	125 552	Thermostat, NC
42	147 676	Transformer
43	181 649	Resistor
44	090 288	Varistor
45	162 264	Capacitor
46	022 160	Clamp
47	118 457	Stabilizer
48	019 663	Foot
49	600 325	Cable
50	153 969	Clamp
51	110 740	GA-16 Gun, (Fig 6-2)
	173 374	Regulator/Flowmeter
	183 581	Hose, gas
52	048 282	Connector
	183 312	Adapter ring, wire spool

*Recommended Spare Parts.

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

Be sure to provide Model and Serial Number when ordering replacement parts.



Item No.	Part No.	Description
1	110 793	Handle Assembly, black
2	110 795	Head Tube
3	110 780	· Nut
4	110 779	· Jacket
5	110 781	· Stop
6	128 878	· Adapter
7	118 571	· Spring
8	110 785	Contact Tip, .023
8	♦110 786	Contact Tip, .030
8	♦110 787	Contact Tip, .035
9	110 789	Nozzle, 1/2 orf
9	♦112 420	Nozzle, 3/8 orf
9	♦110 790	Nozzle, flat spot
10	110 794	Trigger Switch Assembly
11	080 565	Terminal
12	110 792	Cable/Conduit
13	110 797	Sleeve
14	167 440	Liner, .023-.035
15	110 784	· Collet, .035
16	079 974	O-Ring, .500
17	110 796	Connector
18	079 878	Connector & Pins
19	048 834	Connector

♦ OPTIONAL

Figure 6-2. GA-16 Gun (Fig 6-1 Item 52)

Suggested Welding Settings

Wire Type, Shielding Gas, And Flow Rate	Wire Diameter (inch)	Operator Control Settings*	Metal Thickness						
			1/8 in. (3.2 mm)	12 ga.	14 ga.	16 ga.	18 ga.	20 ga.	22 ga. And Thinner
E-71T-GS Flux Core	0.030	Voltage Wire Speed	4 30	3 30	3 20	1 25	1 20	1 20	– –
	0.035	Voltage Wire Speed	4 30	3 25	2 25	1 25	1 25	1 20	– –
ER70S-6, Mild Steel, CO_2, 20 cfh+	0.023	Voltage Wire Speed	4 50	4 50	3 50	2 45	2 40	1 30	1 30
	0.030	Voltage Wire Speed	4 40	4 40	3 40	3 40	2 40	1 40	1 35
ER70S-6, Mild Steel, 75% Argon 25% CO_2, 20 cfh+	0.023	Voltage Wire Speed	4 60	4 55	3 50	2 45	2 40	1 35	1 35
	0.030	Voltage Wire Speed	4 50	4 50	3 50	3 50	2 45	1 45	1 40
ER 308, Stainless Steel, Tri-Mix, 20 cfh+	0.023	Voltage Wire Speed	4 40	4 35	4 35	3 30	3 30	2 20	– –
	0.030	Voltage Wire Speed	4 30	4 30	4 30	3 25	3 20	2 15	– –
	0.035	Voltage Wire Speed	4 15	4 15	4 15	3 15	2 15	– –	– –
Aluminum, Argon, 30 cfh+	0.030	Voltage Wire Speed	– –	4 85	3 80	2 75	1 70	– –	– –
	0.035	Voltage Wire Speed	– –	4 55	4 60	2 60	2 55	– –	– –

*Do not change VOLTAGE switch position while welding. WIRE SPEED value in table is a starting value only, and WIRE SPEED control setting can be fine tuned during welding.

+cfh = cubic feet per hour

TRUE BLUE® WARRANTY

Effective January 1, 1997
(Equipment with a serial number preface of “KH” or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Robots
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
   * Motor Driven Guns (w/exception of Spoolmate 185)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * Orbital Weld Heads
   * IHPS Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * SDX Transformers
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT, ZIPCUT & PLAZCUT Models)
   * Deutz Engines (outside North America)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts and Labor
   * MIG Guns/TIG Torches
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate 185

Miller’s True Blue® Limited Warranty shall not apply to:

1. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer’s warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller’s option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer’s risk and expense. Miller’s option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

Warranty Questions?

Call
1-800-4-A-
MILLER
for your local
Miller distributor.

Miller®
The Power of Blue.